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# Making the PITCH: The Program in Therapeutics for Connecticut's Health

***A new program is paving the way for researchers to deliver new drugs and therapeutic treatments to the state's growing bioscience industry.***

The Program in Innovative Therapeutics for Connecticut's Health (PITCH), a new $10 million, three-year collaborative effort between Yale University and the University of Connecticut (UConn), is poised to quicken the pace at which new drug and therapeutic research moves from the laboratory into the marketplace. Yale's Center for Molecular Discovery in West Haven and UConn's School of Pharmacy in Storrs, as well as researchers and scientists at the UConn Health Center in Farmington, are ready to expedite the creation of new biotechnology companies in Connecticut.

The first 12 PITCH project teams are developing and testing new approaches to well-known diseases and chronic conditions. Infectious disease and oncology are the two dominant trends in the first PITCH portfolio. More specifically, teams are focusing on liver disease, cancer, and bacterial and viral infections, as well as inflammatory conditions.

The independent board who selected these teams did so with the expectation that the teams' efforts would lead to the creation of new biotechnology companies here in Connecticut. The board based their selections on their own experiences as startup company founders, pharmaceutical leaders and prospective investors.

Perhaps the greatest impetus behind PITCH was the frustration that CASE members and co-founders Craig M. Crews, executive director of Yale's Center for Molecular Discovery (YCMD), and Dennis Wright, professor of medicinal chemistry at UConn's School of Pharmacy, experienced in trying to help their fellow colleagues move into the role of entrepreneurs—a role both Crews and Wright successfully navigated. Crews founded the New Haven biotech Arvinas and co-founded Proteolix. Wright is co-founder of Promiliad Biopharma and Synaptic Dynamics.

Crews, in his role as director of YCMD over the past 13 years, saw ongoing research that had true commercial potential, but he didn't have the resources to take the research beyond the lab into the marketplace. As an academic screening center, the YCMD takes the results of basic research studies, condenses the studies down to a drug assay (investigative, analytic procedure in laboratory), and uses the assay to screen libraries of compounds to identify new tools and new agents for academics' use in conducting new experiments leading to papers and grant applications. Typically, government grants are sought from organizations such as the National Institutes of Health (NIH). As the largest public funder of biomedical research in the world, the NIH invests more than $32 billion a year in this type of research. However, the NIH funding stops short of grooming biomedical research for entrée to the marketplace.

Meanwhile, Wright and his counterpart, Sandra Weller, past president of CASE and chair of molecular biology and biophysics

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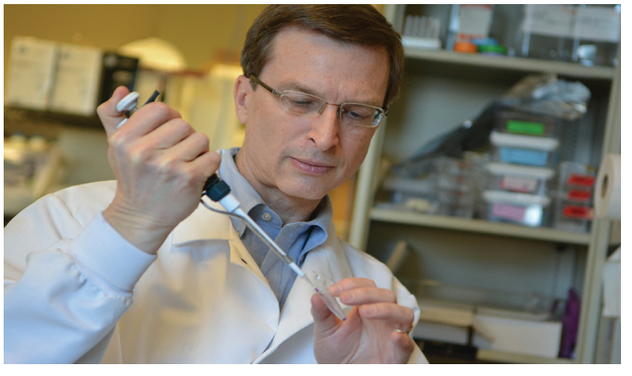

*CASE member and PITCH co-founder Craig M. Crews, executive director of Yale's Center for Molecular Discovery. [Photo: Craig Crews]*

## From the National Academies

The following is excerpted from press releases and other news reports from the National Academies of Sciences, Engineering and Medicine (www.national-academies.org).

### ◆ Report Offers Lessons in Sustainability for US Cities

A new report from the National Academies of Sciences, Engineering, and Medicine offers a road map and recommendations to help US cities work toward sustainability, measurably improving their residents' economic, social, and environmental well-being. Noting that 80% of the US population now lives in urban areas, the report recommends that every US city develop a sustainability plan that not only accounts for its own unique characteristics but also adapts strategies that have led to measurable improvements in other cities with similar economic, environmental, and social contexts. The authors draw upon lessons learned from the efforts of nine cities—Los Angeles; New York City; Vancouver, BC; Philadelphia; Pittsburgh; Chattanooga, TN; Cedar Rapids, IA; Grand Rapids and Flint, MI—to improve sustainability. The cities represent a range of sizes, regions, histories, and economies.

***https://www.nap.edu/catalog/23551/***

### ◆ Vital Directions for Health and Health Care

One of two major initiatives of the National Academy of Medicine (NAM), this ambitious program seeks to promote policy objectives in the new administration that will promote "better health and well-being, higher value health care and strong science and technology" in 19 priority focus areas. It was launched at a public symposium held September 26 in Washington. Guided by an 18-member steering committee, NAM has called on more than 100 leading researchers, scientists, and policy makers from across the United States to provide expert guidance for US health policy. Publication of detailed position papers is projected by

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## PITCH *(from page 1)*

at the UConn Health Center, were putting together teams who could pair basic research with a clinical partner to develop a commercially viable project. They were achieving some successes, but were open to acquiring additional resources.

Luckily for Crews, Wright and Weller, Connecticut has a big appetite for funding bioscience/biotech startups and ventures via the Connecticut Bioscience Investment Fund (CBIF). CBIF's goal is to spur innovation in the biosciences throughout the state by providing targeted financial assistance to startups, early stage businesses, non-profits and accredited colleges and universities. CBIF is under the management umbrella of Connecticut Innovations, whose $200 million fund will be invested over the next 10 years in the form of grants, equity investments and loans to speed commercially viable bioscience breakthroughs into the marketplace.

When Crews heard about CBIF, he contacted Margaret Cartier, vice president and fund manager, to determine the level of interest in funding PITCH. She suggested he make it a statewide initiative. "I reached out to Dennis (Wright), given his entrepreneurial background, and we put together the application for CBIF," Crews said.

With the assurance of a $10 million grant over the next three years, PITCH's executive advisory board crafted a non-traditional application format for Yale and UConn scientists to use in submitting their projects. Wright explained, "We asked the type of questions that investors would ask about a project before they moved forward.




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How strong is the connection between biology and disease? For example, is the gene you're interested in really part of Alzheimer's? If there's a strong connection, how feasible is it for those who do medicinal chemistry or drug development to act on it? Is this a good opportunity for translational work and for entrepreneurial development?" These questions, in a 12 slide-deck format, seek to change the mindset of faculty—what form could their science evolve towards to be helpful for society and from a commercial point of view? According to Crews, this is the first step towards faculty becoming entrepreneurs. "We are giving faculty the tools and experience of interacting with investors, so they can see themselves as entrepreneurs," said Crews.

One of the most valuable resources available to PITCH teams is the quarterly reviews, conducted by PITCH's external advisory board (EAB). PITCH teams present, ask questions, seek scientific input, and ask if they should stop or change direction. For instance, the EAB may say they like the team's target, giving them the green light to start high throughput screening. However, it is the team's decision as to what type of assay to run, what type of library screening to choose, etc. "They're (EAB) more in the bioscience/commercial world than we academics. They have good feeling for where the risk appetite is and what they see as commercially viable going forward," said Wright.

To give the PITCH projects the polish they need to become commercial ventures, projects are taken out of the labs and worked on by professional teams from UConn and YCMD as follows:

- Target proteins that are linked to the underlying cause of a disease are identified, as well as genomic targets, at UConn's Institute for Systems Genomics, an initiative linking the Storrs and Farmington campuses, including the Jackson Laboratory for Genomic Medicine, co-located on the Health Center's Farmington campus.

- UConn's Department of Molecular Biology and Biophysics, at the UConn Health Center, purifies, synthesizes, and then characterizes large quantities of the protein targets. By doing so, the proteins can then undergo high throughput screening to identify lead compounds that modulate the protein's activity. The YCMD conducts assay development and screening of the compounds discovered during the initial screening, then gives the compounds back to the originating lab for use as reagents to investigate the biological system of interest.

- At this point, the EAB weighs in on the commercial potential of the lead compounds that could become the foundation of a new startup or licensing initiative. Those projects with the most potential are handed off to the UConn School of Pharmacy's medicinal chemists who specialize in drug design and development.

- Once the data package is ready for presentation to a potential investor, the lab of origin's faculty member is brought back into the loop and educated on how to pitch the project. "Not only are we working on the science, we are working on the faculty entrepreneurship aspect. This is the most efficient way to unlock all the great science at Yale and UConn and generate new companies in Connecticut," said Crews.

The first 12 PITCH projects are at different stages in development, building upon years of research and experience from the lab of origin. Often the research is pre-existing, but the team isn't. The team members change based on what is needed to move the project forward, thereby creating a cost effective data package that validates the results, making it more attractive for potential investors.


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## Science and Engineering Notes from Around Connecticut

## Biomedical Research

**UB TO RECEIVE NIH GRANT.** The **University of Bridgeport** (UB) was selected by the National Institutes of Health (NIH) to receive the first annual award of a planned five-year, $447,252 grant to support its "Enhancing Research Administration at an Emerging Research Institution in Urban, Southwest Connecticut" project. UB is only one of two US universities to receive funding. The grant, announced August 31, will be used to build research administration capacity and support faculty involvement in biomedical and bio-behavioral research. CASE member **Tarek M. Sobh**, senior vice president for graduate studies and research and dean of the **School of Engineering**, will act as senior advisor.

**GLOBAL HEALTH PARTNERSHIP MARKS 10th YEAR.** This fall, The **Yale Partnership for Global Health** began its tenth year promoting biomedical research by scientists at universities throughout the Global South (Africa, Latin America, and developing Asia including the Middle East) to reduce infectious diseases by educating, training, and supporting careers of biomedical and public health researchers. The program was developed in 2006 by **Elijah Paintsil**, associate professor of pediatrics and pharmacology at **Yale School of Medicine**, and CASE member **Michael Cappello**, professor of pediatrics at **Yale School of Medicine** and co-director of the **Yale Africa Initiative**. The Yale Partnership for Global Health brings young medical researchers to Yale and provides mentorship and training.

**UCONN EXPANDS LAB SPACE FOR STARTUPS.** The **University of Connecticut's** (UConn) **Cell and Genome Sciences** building in Farmington marked the opening of new laboratory space with a ribbon-cutting ceremony on September 22. The labs are leased to 18 technology or biomedical startups within the **Technology Incubator Program**. The incubation program includes 30 companies, many started by UConn students or faculty, based on research done at UConn. These companies generated $45 million in revenues. One startup, **Shoreline Biome LLC**, is developing a product to map microbes in patients and test subjects. Other companies are working on devices to track chronic illnesses by analyzing a patients' breath and a personalized diabetes medicine for patients with genetic cholesterol disorders.

## Business & Industry

**CI, WEBSTER LAUNCH INNOVATION FUND.** In August, **Webster Bank** announced a partnership with **Connecticut Innovations** to create the $1.5 million **UConn Innovation Fund** to provide $100,000 to any in-state start-up research or technology company developed by a UConn student, faculty member or alumnus. UConn's **Technology Innovation Program** companies are also eligible for the investment. The Innovation Fund will be managed by a **UConn Evaluation Board**, fund managers, and an investment committee represented by UConn, CI and Webster Bank.

**MARINE ONE MAINTENANCE TO LEAVE SIKORSKY.** According to **Paul Jackson,** a spokesman for **Sikorsky Aircraft**, the US Navy will no longer use Sikorsky's maintenance program for Marine One helicopters in Stratford, moving the work to the Fleet Readiness Center Southeast in Florida, which is owned by Lockheed Martin. The choppers will continue to be built by Sikorsky. The decision affects about 85 workers at Sikorsky.

**P&W EXPANDS IN CT, WORLDWIDE.** On September 16, **Pratt & Whitney** announced plans to hire 25,000 employees worldwide in the next decade, with about a third of new hires in Connecticut. The hiring will, in part, replace 18,000 expected retirees and will include 1,000 engineers in Connecticut in the next year and more than 1,000 in manufacturing. According to Pratt's president, **Robert Leduc**, the company plans to double production by 2020 and double it again by 2027. Pratt has 34,000 employees worldwide and about 9,500 in Connecticut. Much of the expansion is based on demand for Pratt & Whitney's next-generation PurePower® Engine, known for using less fuel than competitors.

**ACCELERATE UCONN.** **Accelerate UConn**, a **UConn** program launched in the spring of 2015 with funding from the National Science Foundation Innovation Corps, was created to catalyze the transition of new scientific discoveries and capabilities from the lab to the marketplace. Applications for 2016 were submitted in September. Participating teams received an introduction to the I-Corps Curriculum and Lean Launchpad methodology, learning how to gauge the market opportunity for their product or technology. Participating teams received $3,000 in seed funding and were provided with personalized coaching and feedback.

**RENNOVA ACQUIRES GENOMAS.** On September 29, **Rennova Health Inc.** announced its acquisition of Hartford-based **Genomas Inc.**, a genetic diagnostic company that enables physicians to evaluate, select and manage patient medications based on DNA analysis. Results are delivered through an online portal that provides a genetic assessment of current medications or those under consideration. Rennova Health added pharmacogenetic tests performed via FDA-approved in vitro diagnostic (IVD) genotyping kits and acquired referrals for over 400 patients. Genomas is led by CASE member **Gualberto Ruano**, who also leads **Hartford Hospital's Genetics Research Center**.

## Communication

**STATE UPGRADING EMERGENCY CALL SYSTEM.** **Connecticut** is upgrading the emergency system for landline calls, using Next Generation 911. The upgrade, announced in August, allows dispatchers to accept text and video messages and to pinpoint the exact location of a cell phone caller.

**MOBILITIE SEEKING OKAY FOR CELL PHONE TOWERS.** On September 2, **Ridgefield** received notice that Mobilitie, a California-based telecommunications company, wants to build a 120-foot cell phone tower on state-owned land as part of an expansion that could potentially include more than 100 municipalities across Connecticut. Mobilitie claims its technology will improve wireless service in the area and, as the transport utility poles and facilities that are not dedicated to any particular customer, other entities can use the structures pending available capacity. **Kevin Maloney**, spokesman for the **Connecticut Conference of Municipalities**, said that similar applications have been received by more than 100 towns and cities throughout Connecticut. Mobilitie holds a Certificate of Public Necessity and Convenience issued from the state **Public Utilities Regulatory Authority**, allowing the company to provide certain telecommunications services in Connecticut.

**CLOUD-BASED PATIENT PLATFORM ANNOUNCED.** Hartford-based **CareCentrix** recently announced the launch of HomeBridge,

*Items that appear in the In Brief section are compiled from previously published sources including newspaper accounts and press releases. For more information about any In Brief item, please call the Academy at (860) 571-7143, or contact us at acad@ctcase.org.*

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a cloud-based platform to help patients remain at home and avoid unnecessary hospitalizations and readmissions. The platform provides patient's data, tracks clinical events, and collaborates on care, allowing CareCentrix to connect patients and care teams to facilitate continuity of care.

## Education & Cognition

**TECHNOLOGY COUNCIL SPONSORS SKILLS CHALLENGE.** The 2016 **Connecticut Technology Council's Skills Challenge** competition took place in September at **Sacred Heart University** in Fairfield with 10 rounds at various locations, including **Quinnipiac University**, the **University of New Haven** and **Southern Connecticut State University**. This was the second year for the Skills Challenge; the finals of the inaugural competition, occurring in April, included 50 students from ten colleges and universities. The top performers from this year's competition advance to the **Team Hackathon Competition** at the **Yale School of Management** in December.

**SCSU RECOGNIZED BY WHITE HOUSE.** On September 9, **Lisa Lancor**, chair of **Southern Connecticut State University's** (SCSU) **Computer Science Department**, and **Winnie Yu**, a computer science professor, were recognized by the White House for SCSU's science education programs that expand access to science education for grades K to 12. Three primary program objectives are: a commitment to increasing the number of women majoring in computer science, a training program for high school teachers on mobile computing, and a mentoring program for ten SCSU computer science students to conduct after-school computer programming lessons at **Beecher Museum Magnet School of the Arts and Sciences** in New Haven.

**STUDY EXAMINES PRESCHOOL PROGRAM'S IMPACT.** In September, the *Journal of the American Academy of Child and Adolescent Psychiatry* published a study examining the impact of Connecticut's **Early Childhood Consultation Partnership** that brings mental health practitioners into preschool classrooms to support teachers. The study, led by **Walter S. Gilliam**, director of the **Edward Zigler Center in Child Development and Social Policy** at **Yale University**, revealed that the program has had a measurable impact on reducing problem behaviors in young children. After counseling, teachers noted children had lower rates of oppositional behaviors, impulsivity, and hyperactivity, compared to a control group. Other research found preschool teachers are less likely to expel students when they have access to mental health services.

**MARITIME AQUARIUM GETS NOAA GRANT.** The **Maritime Aquarium at Norwalk** has received a $484,955 grant from the National Oceanic and Atmospheric Administration (NOAA) to fund "Sound Resilience – Get On Board!" allowing 2,000 students to "explore how severe storms, erosion and other environmental hazards threaten their communities." Education and research will occur in school classrooms and aboard the Aquarium's hybrid-electric research vessel, R/V Spirit of the Sound ™. Additionally, more than 150 teachers are expected to participate in professional-development workshops.

**UCONN TAKES LEAD IN NELSAMP PROGRAM.** This fall, **UConn** took the lead role for the Northeast Louis Stokes Alliance for Minority Participation (NELSAMP). The alliance, including six New England schools, is dedicated to expanding diversity in STEM fields with support of a $3.5 million grant from the National Science Foundation. The UConn LSAMP Program currently supports 125 students through advising, personal, and professional development.

**WOMEN ENGINEERING GRADS INCREASE. UConn's School of Engineering** reports an increase in female engineering graduates during the past five years, closing the gender gap in its engineering program faster than peer institutions. Between 2010 and 2015, there was a 9.3% increase in female engineering graduates, the highest among public institutions. **Daniel Burkey**, associate dean for undergraduate education and diversity, credits the increase to sustained outreach programs targeting underrepresented students along with a strong support network and numerous resources once students begin their undergraduate education.

## Energy

**LARGEST CT SOLAR FARM LAUNCHED.** The **Mountain Ash Solar Farm**, a 4.7-megawatt array containing more than 15,000 ground-mounted panels located on 15 acres of farmland near **Norwich's Dodd Stadium**, was launched in August, in cooperation with the **Connecticut Municipal Electric Energy Cooperative** (CMEEC), **Norwich Public Utilities** (NPU), **SolarCity** and **Brightfields Development**. It is the largest solar and storage project in Connecticut. CMEEC will purchase the energy under a 20-year power purchase agreement with SolarCity. NPU also plans to include solar power as part of the electric service provided to customers.

**FUEL CELL POWER PLANT IN DANBURY ANNOUNCED.** On September 6, **FuelCell Energy Inc.** announced construction for a 3.7 megawatt fuel cell power plant in **Danbury**. Compared with the standard 2.8 megawatt DFC3000® power plant using two fuel cell modules operating in parallel, the 3.7 megawatt configuration adds a third module using unused fuel and heat. This power plant will power approximately 3,700 average-size homes and occupy 10,000 square feet in an industrial lot near an existing electrical substation. FuelCell expects to sell the power to the local utility, supplying the power to a nearby electrical substation and selling the project after commissioning.

**HOSPITAL UNVEILS ROOFTOP SOLAR ARRAY.** This fall, **Saint Francis Hospital and Medical Center** unveiled a 535-kilowatt rooftop solar array atop the hospital's parking garage. St. Francis worked with Soltage to receive funding from the state's **Zero Emissions Renewable Energy Credit** (ZREC) program. Soltage owns the approximately 1,500 panels and the hospital will pay Soltage for the electricity generated under a 20-year power purchase agreement. The hospital expects the arrangement to yield $600,000 in cost savings over the next two decades.

**NEW PURA COMMISSIONER NAMED. Katie Dykes**, deputy commissioner of the **Connecticut Department of Energy and Environmental Protection** (DEEP), was nominated by **Governor Dannel Malloy** to serve as a commissioner for the **Public Utilities Regulatory Authority** (PURA). PURA is based in New Britain and regulates the rates and services of utility and telecom companies operating in Connecticut. Dykes served at DEEP since March 2012. She is also the chairwoman of the **Regional Greenhouse Gas Initiative's** board of directors.

**GREEN BANK GETS FEDERAL SOLAR GRANT.** In October, the US Department of Energy announced a $160,000 grant to **Connecticut's Green Bank** for assisting low and moderate-income residents to take advantage of solar-power programs. The funding is part of a $1.73 million federal allocation for the "SunShot" program focused on increasing solar power availability to lower income families.

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**STATE ABANDONS REVIEW OF GAS PIPELINE PROPOSALS.** **Connecticut** energy officials have abandoned a review of natural gas pipeline proposals as rulings in Massachusetts and New Hampshire indicated the cost of upgrading pipelines would be passed onto ratepayers. **Dennis Schain**, spokesman for the **Connecticut Department of Energy and Environmental Protection,** says the state does not want to continue with regional projects if costs cannot be shared among states. He noted the decision does not affect expanding natural gas to Connecticut homes and businesses, and the state is continuing to encourage increased use of natural gas.

**$CO_2$ REDUCED BY 36% UNDER CAP-AND-TRADE PROGRAM.** According to the August 12 report from **Regional Greenhouse Gas Initiative**, of which Connecticut is a member state, the program reduced annual average carbon dioxide emissions from electric generation sources by nearly 36% compared to the 2006–2008 base period, amounting to 44.7 million metric tons of $CO_2$. The nine member states in the initiative created a cap-and-trade program for pollution permits, encouraging cleaner generation technologies.

## Environment

**DEEP RELEASES AQUIFER VIDEO.** The **Connecticut Department of Energy and Environmental Protection** (DEEP) has released a new video titled "What is an Aquifer?" to inform residents about hidden water resources. The video demonstrates how aquifers are recharged and hold water, how contamination occurs, and how aquifers can be cleaned of contamination.

**AQUATIC INVASIVE FOUND.** In September, the **Connecticut Department of Energy and Environmental Protection** found the invasive aquatic hydrilla plant, *Hydrilla verticillata*, growing along **Riverfront Park** in **Glastonbury**. Hydrilla, a destructive plant, is not native to the United States. State environmental officials do not know its origin but it has been identified in some Connecticut waterways, including the **Silvermine River** and **Coventry Lake**. The plant grows aggressively, blocking sunlight and displacing native species.

**YALE ANNOUNCES SUSTAINABILITY PLAN.** On October 3, **Yale University** President and CASE member **Peter Salovey** announced the Yale Sustainability Plan 2025. Developed by faculty, students and staff members, the plan outlines 20 objectives and 38 specific goals for Yale to achieve in the next nine years. The recommendations include a greater alignment of Yale's sustainability and academic goals as well as outreach beyond Yale's campus. One goal is to make Yale carbon-neutral by 2050.

**DROUGHT PROMPTS EMERGENCY ORDER.** On October 18, the **Connecticut Department of Public Health** issued an amended emergency order allowing the **Aquarion Water Company** to build 8,000 feet of temporary above-ground pipeline to transfer additional water from the **Southwest Regional Pipeline** to its Stamford system, serving **Stamford, Greenwich, Darien** and **New Canaan** due to drought conditions. Approximately 86% of Connecticut is under severe drought conditions.

## Food & Agriculture

***E COLI* OUTBREAK PROMPTS FARM CONFERENCE.** On August 24, the **Connecticut Department of Agriculture** held a conference for farmers to learn how to manage risk, as well as how outbreak investigations are conducted. Speakers included experts from the department, the **Connecticut Department of Public Health, UConn Extension**, federal Centers for Disease Control and Prevention, USDA, APHIS Veterinary Services, and others. The recognition of a need for enhanced education follows an outbreak of *E. coli* in March at a Lebanon goat dairy farm.

**HOPS REVIVAL.** Branford-based **DuVig Beer Brewing Co.** is using hops grown on the Guilford's **Dudley Farm**. The hops were planted five years ago by **Rich Decker** and **Dave Hall**. "This is a historically preserved farm, so this is the way that hops would have been grown in the colonial days, around the late 1800s," commented Decker. According to **James A. LaMondia**, plant pathologist at the **Connecticut Agriculture Experiment Station** (CAES), growing hops was once popular in Connecticut, but their susceptibility to downy mildew, coupled with Prohibition, led to the crop's demise. Interest in hop production in the Northeast is on the rise due to the increasing popularity of local craft beers. The CAES has established two hop yards with several cultivars using high and low trellis systems to evaluate yield, growing characteristics, and susceptibility to diseases and pests.

**NEW PROGRAM ENCOURAGES SHELLFISHING.** State Senator **Ted Kennedy, Jr.**, and **Connecticut Department of Agriculture Commissioner Steven Reviczky** recently announced a program to encourage new participants in Connecticut's oyster and clam industry. The department will offer access to shellfish beds surrounding the **Thimble Islands** to encourage newcomers to the industry to learn the necessary skills and explore their interest in developing a career in aquaculture.

**WEST NILE, EEE FOUND IN CT MOSQUITOES.** The **Connecticut Mosquito Management Program** announced that West Nile virus-infected mosquitoes were found in 20 Connecticut towns in four counties (**Fairfield, Hartford, New Haven** and **New London**) this past summer. One state resident was reported with WNV-associated illness. Eastern Equine Encephalitis, a rare but serious viral disease in humans was identified in mosquitoes trapped in Voluntown on September 12. No Zika virus positive mosquitoes were identified. The annual mosquito trapping and virus testing program is conducted by the **Connecticut Agricultural Experiment Station.**

**RECALL OF TAINTED BEEF.** On October 3, state public health officials released a list of fourteen Connecticut farms that received beef tainted with E. coli after the meat was processed in a Massachusetts slaughterhouse. The US Department of Agriculture issued a recall for beef, veal, and bison from the Adams Farm Slaughterhouse. **Tracey Weeks**, of the **Connecticut Department of Public Health**, said this investigation was the result of cooperative work that reduced a multi-month investigation to several days.

## Health

**HORWICH HONORED.** Yale's **Arthur L. Horwich**, CASE member and Sterling Professor of Genetics, professor of pediatrics, and investigator for the **Howard Hughes Medical Institute**, has been awarded the 2016 Albany Medical Center Prize in Medicine and Biomedical Research, along with F. Ulrich Hartl of the Max Planck Institute and Susan Lindquist at the Massachusetts Institute of Technology. Their research showed proteins must be folded in proper three-dimensional structure to perform crucial life functions. The scientists demonstrated this folding does not occur spontaneously as previously believed, but depends upon molecular "assistants" in a process called "chaperone-mediated protein folding."

**NEW LAW REQUIRES SCREENING FOR ALD.** Connecticut has joined New York as one of only two states in the country requiring

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newborn screening for Adrenoleukodystrophy (ALD), a disease affecting the tissue lining around the adrenal glands and nerve cells in boys. The family of 27-year-old **Brian Kelley** promoted the legislation because studies indicate that boys can lead typical lives with ALD if it is detected at birth and treated throughout childhood.

**PEDIATRIC PARTNERSHIP COULD UNITE CCMC, YNHCH.** On October 10, **Connecticut Children's Medical Center** and **Yale New Haven Children's Hospital** announced preliminary talks for a pediatric care partnership that could create one of the largest children's hospitals in the nation. A moratorium against hospital mergers is in place until June 2017; however, it is unclear whether this merger is subject to the moratorium.

**STUDY FINDS ALZHEIMER'S, SCHIZOPHRENIA LINK.** Researchers, led by CASE member **Paul Lombroso**, the Elizabeth Mears and House Jameson Professor in the **Child Study Center** and professor of neurobiology and psychiatry at **Yale**, and Kristen Brennand at the Icahn School of Medicine at Mount Sinai, recently published findings showing that STEP (STriatal-Enriched protein tyrosine Phosphatase), a protein associated with the cognitive decline of Alzheimer's disease, also plays a role in the genetic predisposition to schizophrenia. The research, published in the October 18 issue of *Molecular Psychiatry*, suggests the possibility that drugs that target STEP could be used to treat a variety of neuropsychiatric disorders. Lombroso said he and Yale colleagues **Jonathan Ellman** in chemistry and CASE member **Angus Nairn** in psychiatry are developing new STEP inhibitors; if successful, these may have therapeutic value.

## High Technology

**TANG TO HEAD 'ACQUIRE' TEAM.** CASE member **Hong Tang**, the Llewellyn West Jones, Jr. Professor of Electrical Engineering & Physics at **Yale University**, will head a team of researchers as part of an initiative, funded by the National Science Foundation (NSF), designed to advance the technology needed for secure communication over long distances. Tang's group includes researchers from Princeton University and BBN Technologies and is one of six interdisciplinary teams nationwide funded with $12 million in grants from NSF's Office of Emerging Frontiers and Multidisciplinary Activities (EFMA). The initiative is part of Advancing Communication Quantum Information Research in Engineering (ACQUIRE). Tang's team will research integrated nanophotonic solid state memories for telecom wavelength quantum repeaters.

**YALE ASTRONOMERS EXAMINE 'STAR CHEMISTRY'.** A new study by **Yale** researchers **Debra Fischer**, CASE member and professor of astronomy and geology & geophysics at Yale, and **John Michael Brewer**, which will appear in *Astrophysical Journal,* describes a computational modeling technique that provides a clear understanding of "star chemistry, revealing conditions when their planets formed." The new technique allows scientists to assess the habitability and biological evolution possibilities of planets outside our solar system.

**TOP TECH WINNERS NAMED.** On September 22, Marcum LLP and the **Connecticut Technology Council** announced the 2016 Marcum Tech Top 40 winners. The Marcum Tech Top 40, in its 9th year, recognizes technology companies with at least $3 million in annual revenue and a four-year record of growth in six sectors. The overall 2016 winner is **Revolution Lighting**, a company that designs, manufactures, markets, and sells LED lighting. It has experienced revenue growth of 2793% since 2012. Other 2016 category winners are: **Achillion Pharmaceuticals Inc.** (Life Sciences); **Continuity** (Software); **C-TEC Solar LLC**, (Energy/Environmental/Green Technologies); **Datto Inc.** (IT Services); and **Discover Video Inc.** (New Media/Internet/Telecom).

**NEW CYBERSECURITY CENTER PLANNED.** Stamford-based financial services firm **Synchrony Financial** and the **UConn School of Engineering** will launch a Synchrony-funded **Center of Excellence in Cybersecurity** to support education and research in the field of cybersecurity. **Kazem Kazerounian**, CASE member and dean of the UConn School of Engineering, stated, "The program builds on the success of the Engineering School, which celebrates its centennial this year, and allows us to provide robust opportunities for our students looking to pursue a career in cybersecurity."

## Transportation

**PEARL HARBOR BRIDGE GETS TOP HONOR.** The recently renovated **Pearl Harbor Memorial Bridge** in New Haven, also known as the Q-Bridge, has been awarded the Grand Prize for transportation projects in the 2016 America's Transportation Awards competition sponsored by the American Association of State Highway and Transportation Officials (AASHTO), AAA and the US Chamber of Commerce. The renovation project, begun in 2008, was the biggest project ever undertaken by the **Connecticut Department of Transportation** and employed a design new to the United States. The $554 million bridge spans 42 hundred feet over the **Quinnipiac River**, connecting 140,000 vehicles daily to several major interstates and the Gateway Terminal.

**HARTFORD VIADUCT TO BE REPLACED.** Steps are underway to replace I-84 **Hartford Viaduct** through downtown **Hartford** and the **Asylum Hill** neighborhood as part of the Hartford Viaduct Project, according to an announcement by **Governor Dannel Malloy** in September. **Connecticut Department of Transportation Commissioner James P. Redeker** explained that the highway was originally designed to carry 50,000 vehicles per day; however, today up to 175,000 vehicles use this section of highway daily—the highest volume in the state. On average, there are two crashes per day. The project is intended to address I-84's structural deficiencies and improve traffic operations, safety, and mobility.

**METRO-NORTH LAUNCHES MOBILE TICKET PLATFORM.** On August 22, **Metro-North Commuter Railroad** launched MTA eTix: a mobile-ticket platform in **New Haven, New Canaan, Danbury** and **Waterbury**, allowing commuters to show the digital ticket on their device to the conductor. The e-ticket system interfaces with an e-ticket booth, a ticket wallet similar to Apple Wallet and an information menu linking customers to regional travel services, maps, schedules and MTA policies.

**ZERO EMISSION VEHICLES COULD MEAN HEALTH CARE, ENVIRONMENTAL SAVINGS.** A recent study by the American Lung Association of California found that **Connecticut** could save $1.3 billion in yearly health care costs and climate damage if 65% of the state's motorists drove zero emission vehicles (ZEV) by 2050. Connecticut has agreed to reduce vehicle pollution by offering ZEV rebates to meet a goal of 3.3 million emission-free vehicles on the road by 2025. The state currently offers a cash rebate of up to $3,000 toward the purchase or lease of an eligible electric vehicle or plug-in hybrid car and is preparing to offer a $5,000 rebate for fuel cell-powered cars once they become available.

***—Compiled and edited by Wendy Swift***

## NAS *(from page 1)*

the end of the year; impact will depend upon relevant appointments in the new administration, yet to be named as of this writing.

***https://nam.edu/initiatives/vital-directions-for-health-and-health-care/***

### ◆ Engineering the Science of Learning

Four years since the creation of Coursera and edX, there is much to celebrate in the accomplishments of research into massive open online courses (MOOCs) and other forms of open online learning. Millions of students have participated in thousands of courses, leaving a trail of billions of log events recording their behavior, efforts, failures, and successes. From these massive records, researchers have documented the demographic characteristics of learners and patterns of course participation, and they have begun exploring methods for supporting greater persistence and completion in courses. The challenge is to create courses that are engines of research, learning, and improvement. Internet companies in the private sector have demonstrated the capacity for iterative development in online services through constant experimentation and refinement. Universities and their MOOC platform partners should apply these insights to the emerging platforms of online learning. The next era should be characterized by a targeted focus on building the infrastructure that will allow MOOCs to more effectively advance the science of learning.

***https://www.nae.edu/Publications/Bridge/162252/162627.aspx***

### ◆ Understanding the Cumulative Impacts of Human Activities on Marine Mammals

Rising levels of noise in the ocean have been identified as a growing concern for the well-being of marine mammals, but other threats such as pollution, climate change, and prey depletion by fisheries may also harm marine mammals and influence their response to additional noise. Current knowledge and data are insufficient to determine what combination of factors causes the greatest concern, says a new report by the National Academies of Sciences, Engineering, and Medicine. The report, which builds on previous reports that explored the impact of sound on marine mammals, places sound in the context of other stresses that these animals may experience and highlights three main challenges in making progress on the issue of cumulative effects: understanding the interaction between different stress-causing agents (stressors), designing studies to better understand the response to more than one stressor, and the difficulty in detecting impacts at the population level. It includes a newly developed conceptual framework model to help federal agencies and research communities explore the potential cumulative effects of human activities on marine mammals.

***https://www.nap.edu/read/23479/***

*The following Connecticut scientists were elected to the National Academies in 2016:*

### NATIONAL ACADEMY OF SCIENCES

**Frederick J. Sigworth, PhD**

Professor of Cellular and Molecular Physiology and of Biomedical Engineering
Yale University

**C. Megan Urry**

Israel Munson Professor of Physics and Astronomy
Yale University

### NATIONAL ACADEMY OF ENGINEERING

**Michael Maloney**

Manager of Structural Alloy,
Hot Section Materials and Coatings
Pratt & Whitney

### NATIONAL ACADEMY OF MEDICINE

**Hugh Smith Taylor, MD**

Anita O'Keeffe Young Professor of Obstetrics, Gynecology, and Reproductive Sciences
Professor of Molecular, Cellular, and Developmental Biology,
Chair of Obstetrics, Gynecology, and Reproductive Sciences
Yale School of Medicine
Chief of Obstetrics and Gynecology
Yale-New Haven Hospital

### ◆ Grand Challenges in Health and Medicine

This long-term multidisciplinary initiative from the National Academy of Medicine seeks to "inspire leaders from across disciplines—from academia, government, industry, business, philanthropy and the public" to "spur innovation, steward collective strategies and engage public and private-sector resources around common goals were the promise of progress is great." Models cited include the federal "Brain Initiative and Grand Challenge for Development," the National Academy of Engineering's "Grand Challenges for Engineering," and the Bill & Melinda Gates Foundation's "Grand Challenges in Global Health."

***https://nam.edu/initiatives/grand-challenges-in-health-and-medicine/***

# *DEEP'S Quinebaug Valley Trout Hatchery*

If you caught a trout in the Salmon River, you might trace it to the Quinebaug Valley Trout Hatchery in Plainfield, operated by Connecticut's Department of Energy and Environmental Protection (DEEP).

The Hatchery annually raises 75% of the state's fry (baby) and adult trout for recreational fishing, releasing them into 2,500 waterbodies east of the Connecticut River each spring. Quinebaug's mission is "to promote sport fishing for the public using catchable size trout, to enhance or restore self-sustaining trout populations, and to mitigate the pressure on wild trout stocks."

The Hatchery's center, open from 8 am to 3 pm, features exhibits and viewing windows to watch fish eggs incubate and become fry in the Hatch House (August to December). Circular indoor tanks hold medium-sized fish until they are large enough to move to outdoor Grow Out Tanks for stocking. A warehouse showcases 20 Brood Stock Raceway troughs, where adult fish that provide eggs used for hatching splash and tumble. Adjacent to the Hatchery is a children's pond, where new anglers can fish for trout.

Sustaining fish production requires water (14 wells supplying over 3,000 gallons per minute!) and technology (a numerical control facility). It also calls for some new cost-saving upgrades: high efficiency LED motion lighting and well pumps; a recirculating aquaculture system for the Grow Out tanks, and outdoor tank netting.

The Hatchery, located at 141 Trout Hatchery Road in Central Village, schedules guided tours for high school and college aquaculture students and for Trout Unlimited, a non-profit organization with a mission to conserve, protect and restore North America's coldwater fisheries and their watersheds, and other special groups. Visit the Hatchery at www.ct.gov/deep/cwp/view.asp?A=2696&Q=536214 or call 860-564-7542 for more information.

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Visit our web site at www.ctcase.org

## PITCH *(from page 2)*

Early on, PITCH caught the attention of 20 firms nationwide who signed up to review the teams' preliminary data packages. Known as the "Venture Board," they conduct periodic reviews of projects that are close to completion. In October, the Venture Board held its first review with six teams presenting. The Board indicated interest in two of the six becoming companies within the next year.

PITCH has piqued the interest of the academic world as well. In October, Crews was invited to speak about PITCH at the University of Michigan (UM-Ann Arbor). Having purchased the former Pfizer site in Ann Arbor, just as Yale purchased the Bayer site in West Haven, UM-Ann Arbor now has a large pharma campus and is exploring ways to use it as a catalyst to accelerate basic research into the creation of new bioscience businesses.

In a world filled with acronyms, PITCH is aptly named and can be looked at from several perspectives. Scientists from amongst the state's largest research universities are being asked to step out of the lab and into the boardroom to pitch their projects to prospective investors. Connecticut's Bioscience Investment Fund is making a pitch for the state to become a big player in the biotech industry, thus improving Connecticut's economic health. And, most importantly, new drugs and therapeutic processes are being fast-tracked into the marketplace to improve the health of those struggling with chronic conditions and life threatening diseases. ***— Deborah Mearman, science writer.***

*Right: CASE member and PITCH co-founder Dennis Wright, professor of medicinal chemistry at UConn's School of Pharmacy. [Photo: Dennis Wright]*